

Article by Alexander Graham Bell, undated

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a few thoughts by Dr. Bell concerning Baddeck No.2

Their whole future may depend upon what happens on the 8th. Hope you will send them a telegram of encouragement.

A few thoughts by Dr. Bell Baddeck No.II. The Edition of that has copied the notes from Dr. Bell's note book:

The last time they tried the Baddeck No.II they had poor luck and were considerably disappointed over the logy behavior of the machine in the air. In

In trying to account for this logy behavior I suggested, among other things, that it might have been due to rarification of the air in the Baddeck River Valley. Casey expressed the opinion that a machine should fly better, and at greater velocity in rarified than in dense air. This led me to suggest that if this were the case a machine would support itself and go with greater velocity at a high elevation in the air than near the surface.

Casey then took the subject under serious consideration and has succeeded in demonstrating to my satisfaction that it really is the case that a machine capable of supporting itself near the ground will also support itself at the very highest elevation it can attain and fly there with much greater velocity without the expenditure of any more power and without the expenditure of more fuel.

He showed that, if the machine can reach an elevation where the atmospheric pressure is only one-half of what it is on the surface, the machine will support itself and travel at double the velocity.

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The question then arose — At what elevation would the atmospheric pressure be diminished to one-half and would it be possible for a man to breathe there if he could get up.

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I found, from Davis' meteorology, that it would be necessary to ascend to an elevation of about 16000 ft., somewhere about three miles, in order to accomplish this result; and Casey found that Glaisher ascended in a balloon to a very much greater height and could breathe, without the artificial aid of oxygen gas, at a height of 25000 feet, or nearly five miles, and that at this elevation the barometer registered only between ten and eleven inches of mercury, so that the atmospheric pressure was only one-third of that at the surface of the earth. According to Casey's calculations an aerodrome at that elevation would support itself with a velocity three times that it would have at the surface.

Baddeck No. II travels, at the surface, at the rate of about 40 miles an hour. If it could reach the elevation attained by Glaisher it should go three times as fast with the same power and fuel, that is, at the rate of 120 miles per hour.

This opens up a new vista for aviation. We now see clearly that aerodromes are better adapted for use at great elevations in the air than close to the surface; and great possibilities lie before aviation. The difficulty of breathing in a rare atmosphere experienced in a balloon would not be felt in a machine traveling over 100 miles an hour.

I have sent you extracts from our Note Books that will show you the progress of the discussion upon this matter and will only say that we consider the result no longer problematical; and so far from being impracticable of attainment excepting in theory the aerodromes we now have would be capable of climbing to the height desired and going at this great speed with no other change than a change of gearing like that provided on automobiles. I can't go into details now, but will only give you some of the

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consequences that occur to my mind that will show that we have made a distinct step in reaching the conception and realizing its practicability.

The Aerodrome in Peace and War

With the speed of only twice that now attained at the surface the aerodrome gives us the most rapid means of transportation known; while Glaisher's results seem to indicate that we can get three times the speed with the machines we now have. This means the use of the aerodrome as a means of carrying the mail. Important despatches that require expedition will go by drome; and by simply traveling high in the air will be sent at a rate exceeding 100 miles per hour. It is not necessary to invent a new form of aerodrome to accomplish this result, the machines we have will do it.

England greatly fears that some time or other the Zeppelin war balloons of Germany will be found hovering over London because no means are known, at present, by which such a result could be prevented. Casey's researches show that the aerodrome exceeds the dirigible balloon in speed; and that it can always ascend to a higher elevation than a dirigible balloon. This means that the aerodrome, in warfare, will have the dirigible balloon at its mercy. The balloon is limited in its power of ascension. If it is adapted to move at a certain elevation in the air it cannot go very much higher without becoming larger. The aerodrome, on the other hand, is unlimited in the height to which it can attain. 5 339 and can always, in an emergency, climb higher than the balloon.

An eagle can do nothing with a cloud of little sparrows above it; what then could a Zeppelin balloon do with aerodromes above. The whole subject broadens; and the world will soon recognize that a marked step has been made in the progress of aviation.

The subject is of so much importance that I have asked Casey to write a Scientific paper that could be submitted for the opinion of experts. Elaborating the idea and giving his

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reasons in Scientific form. He has started to do so and I now enclose a copy of his rough draft of a paper. AGB